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A LEGAL REGIME FOR SPACE TOURISM: CREATING LEGAL CERTAINTY IN OUTER SPACE

DR. ZHAO YUN*

"Just tell me the general idea you have in mind—the idea Sven and my daughter keep so mysteriously to themselves. What is this thing that's so revolutionary and daring? Fantastic and at the same time logical? I'm quoting, of course, my daughter." He looked steadily at Lee. His eyes brightened as if an inner light had been turned on. Lee glanced at the architect and the girl. He found response in their faces. "I need your assistance in building a hotel in outer space," he said artlessly.¹

I. INTRODUCTION

A STORY LIKE the above must be the truly classic scene for space futurists. Outer space exhibits an unlimited source for imaginative science fiction writers. Earlier in the mid-nineteenth century, a number of science fiction stories were written showing the rich imagination from renowned authors.² Space tourism was among the most popular topics for those writers.³ But no one has taken this idea so seriously as in the late twentieth century.

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¹ CURT SIODMAK, SKYPORT 11 (1961).

² Jules Verne, a French writer, authored several science fiction stories, the most famous of which was entitled "De La Terre á la Lune." JULES VERNE, DE LA TERRE Á LA LUNE (1865).

³ See SpaceFuture.com, Space Tourism in Science Fiction, <http://www.spacefuture.com/tourism/sciencefiction.shtml> (last visited Sept. 23, 2009).

The successful launch of the first satellite Sputnik I in 1957,⁴ and Gagarin's first manned space flight in 1961,⁵ marked breakthroughs in space history. The rapid development of space technology brings the dream of conquering outer space to reality. In view of the large amount of investment and the long period of time needed to harvest the benefits, state monopoly has been the typical characteristic of space activities since the launch of Sputnik I, as acknowledged by the space treaties enacted by the United Nations (UN). However, private parties have increasingly shown interests in space activities, posing great challenges to the former legal regime.

Space tourism, once not considered an area of priority for commercialization, had never been so heatedly discussed until the historic arrival of the two "unexpected" tourists—American Dennis Tito and the twenty-eight year-old South African multimillionaire Mark Shuttleworth—at the International Space Station (ISS) in April 2001⁶ and April 2002,⁷ respectively. The ISS partners officially cleared the way for space tourism with the approval of the two visits.⁸ Such private visits were costly, except possibly for some tycoons. As reported, Tito and Shuttleworth flew to the ISS for an amount of \$20 million each.⁹ This amount is unaffordable to most people.

However, market research has clearly demonstrated that many people have strong interest in space travel if it were more affordable. These wishes can be met with the development of reusable launch vehicle (RLV) technology, which could reduce space launch costs from \$10,000 per pound to \$1,000 per

⁴ Sputnik I was launched from the Baikonur Cosmodrome in Southern Kazakhstan on Oct. 4, 1957. See Craig Covault, *Policy and Technology Shape Manned Space Ops*, AVIATION WK. & SPACE TECH., Jan. 8, 2001, at 44.

⁵ *The First Cosmonaut in the World is in Space*, BBC NEWS, Apr. 1, 1998, available at http://news.bbc.co.uk/1/hi/special_report/1998/03/98/gagarin/72182.stm.

⁶ Anna Badkhen, *US Tourist Arrives at Space Station: Tito is Greeted by Russians after Weekend Flight*, BOSTON GLOBE, May 1, 2001, at C4.

⁷ First African in Space, <http://www.africaninspace.com/home/mission/logs/1/index.shtml> (last visited Sept. 23, 2009).

⁸ SpaceRef.com, Decision Paper on Rosaviakosmos Request of Exemption to Fly Mr. Dennis Tito, Apr. 24, 2001, <http://www.spaceref.com/news/viewpr.html?pid=4604> (last visited Sept. 23, 2009).

⁹ Peter Baker, *U.S., Russia Agree to Allow "Space Tourists"*, WASH. POST, Aug. 10, 2001, at A20; Badkhen, *supra* note 6; see also Richard Stenger, *African Space Tourist Ends \$20 Million Odyssey*, CNN.COM, May 5, 2002, <http://archives.cnn.com/2002/TECH/space/05/04/africa.tourist/index.html>.

pound.¹⁰ These advancements are extraordinary, especially considering that in the past the only method available for getting to space was through the costly method of rocket transportation. Just as Bachula stated, "reliable, affordable access to space is a fundamental prerequisite if we are to realize the full potential of [the outer space] frontier."¹¹

The development of space tourism no doubt calls for a legal regime to better regulate the market as well as to offer clear guidance and expected outcomes. It has been widely argued that the existing international space treaties are inadequate for space commercialization.¹² Among these inadequacies are the current liability regime, which does not provide reasonable recourse and accountability measures for private parties in outer space, and the registration regime with its cumbersome registration requirements.

It is noted that the Russian Space Agency had intended to send two civilians into outer space every calendar year until the February 1, 2003 Space Shuttle Columbia disaster.¹³ Space tourism is also an interesting topic in China. It has been reported that the first Chinese space tourist is expected very soon.¹⁴ Similar reports are expected from other nations in the coming period.

With the strong demand for space tourism, the development of a clear and predictable legal regime is essential before space tourism becomes affordable for the masses, no matter whether the RLVs can be successfully developed in the near future or not. As long as the space travel technology is mature, there are always business opportunities for space tourism.

This article discusses the potential for a commercial space tourism industry and examines a possible legal regime for space tourism. It is the main thrust of this article that proper legal

¹⁰ Roscoe M. Moore, *Risk Analysis and the Regulation of Reusable Launch Vehicles*, 64 J. AIR L. & COM. 245, 251 (1998).

¹¹ *US Commercial Space Launch Industry: Hearing Before the Subcommittee on Science, Technology and Space of the Sen. Comm. on Commerce, Science, and Transportation*, 105th Cong. (1998) (statement of Gary R. Bachula, Acting Under Secretary for Technology, U.S. Department of Commerce).

¹² Joanne Irene Gabrynowicz, *Space Law: Its Cold War Origins and Challenges in the Era of Globalization*, 37 SUFFOLK U. L. REV. 1041, 1056 (2004).

¹³ Jim Banke, *Space Tourists to Station on Hold*, SPACE.COM, Jan. 31, 2003, http://www.space.com/missionlaunches/sts107_tourism_030205.html; see also STS-107: Columbia Disaster, Feb. 1, 2003, <http://www.space.com/columbiatragedy>.

¹⁴ *Zhejiang Businessman Gets Ready for Space Tour*, CHINAVIEW.CN, Nov. 28, 2006, http://news.xinhuanet.com/english/2006-11/28/content_5400730.htm.

principles must be enacted so as to encourage investment and research in space tourism, thereby encouraging investment in this new industry, faster development in space technology, and ultimately faster benefits to the international community.

Part II of this article offers a comparison of space and air travel and the rules applicable to each means of travel. This part further proposes an appropriate liability regime for space travel, trying to borrow the experience from air transportation. Part III examines the appropriate level of state interference through registration and licensing measures. Part IV specifically discusses the status of space tourists, as differentiated from astronauts. Part V concludes that current space law inadequately addresses space tourism and that the inadequacies justify an urgent need to develop an appropriate legal regime for the development of space tourism.

II. SPACE TRAVEL AND AIR TRANSPORTATION: DIFFERENT APPLICABLE LAW

The Wright Brothers' successful flight at Kitty Hawk in 1903 opened a new era in transportation history.¹⁵ The international society was quick to respond with the development of a legal regime for regulating commercial air transportation. The Warsaw Convention¹⁶ was formulated in 1929 to develop a forward-looking international aviation regime.¹⁷ The regime proved to be vital to the development of the air transportation industry by shielding the fledgling airline industry from cost-prohibitive insurance premiums and unlimited liability for accidents.¹⁸

Space travel stands at exactly the same crossroad as air transportation did in the early 1920s. The potential liability for accidents is a major obstacle. The legal vacuum in this respect deters the commercialization of space travel. Insurance is not the way out since the huge cost of insurance for space travel will

¹⁵ Richard P. Hallion, *Remembering the Legacy: Highlights of the First 100 Years of Aviation*, 34 THE BRIDGE: LINKING ENGINEERING & SOCIETY, Spring 2004, at 5.

¹⁶ The Convention for the Unification of Certain Rules Relating to International Carriage by Air, Warsaw, *opened for signature* Oct. 12, 1929, 49 Stat. 3000, 137 U.N.T.S. 11, *reprinted in* 49 U.S.C. § 40105 (West 2001) [hereinafter Warsaw Convention].

¹⁷ I.H. PH. DIEDERIKS-VERSCHOOR, AN INTRODUCTION TO AIR LAW 101 (8th rev. ed., 2006).

¹⁸ Lawrence J. Kelly, *Is that "Whoosh" You Hear a New Whisper-jet Whisking Across U.S. Skies, or the Peruvian "Sucking-sound" of Jobs Leaving the Country? A Review of the Impact of US-EU Open Skies Agreement Negotiations on the Leverage, Lifestyle, and Legal Standing of U.S. Aviation Labor*, 14 L. & BUS. REV. AM. 699, 706-07 (2008).

be passed on to the tourists and the ticket prices will go far beyond a reasonable level and kill the whole space industry.¹⁹ Accordingly, the formulation of an appropriate liability regime for space travel appears all the more important.

Air transportation and space travel share a number of similarities, leading to the discussion of extending the air transportation regime to space travel. The discussion again goes back to the classic question on the boundary of outer space and air space and, thus, the application of air law and space law.

Outer space begins where territorial air space ends. There is currently not a clear internationally recognized boundary of outer space²⁰ and, consequently, not a proper definition despite the separate bodies of international law governing air space and outer space.²¹ "Striking criteria" distinguishing air space and outer space for applicable law include "purpose and function, technical configuration and capabilities, and the medium where the operation predominantly takes place."²² Space travel, as denoted by its concept, has clearly classified itself as an activity in outer space. Furthermore, activities a sufficient distance from the Earth have no problem in justifying the application of space law for space travel.

The air transportation regime, characterized by state sovereignty over air space, substantially differs from the space travel regime where no state can claim sovereignty over outer space.²³ This fundamental difference justifies the necessity of developing a distinct legal regime for space travel. Nevertheless, as one scholar has correctly identified, "air law became a subject for analogizing when the potential for space flight became apparent, although sovereignty concerns persisted Air law analogies have been cited mostly in connection with the formulation of law and policies for aerospace vehicles and the pre-flight re-

¹⁹ Frans G. von der Dunk, *Passing the Buck to Rogers: International Liability Issues in Private Spaceflight*, 86 NEB. L. REV. 400, 414–16 (2007).

²⁰ U.N. Comm. on Peaceful Uses of Outer Space, Report of the Legal Subcomm. on its 41st Session, Held in Vienna from Apr. 2 to 12 2001, ¶¶ 58–62, U.N. Doc. A/AC.105/787 (Apr. 19, 2002).

²¹ I.H. PH. DIEDERIKS-VERSCHOOR, AN INTRODUCTION TO SPACE LAW 5 (3rd rev. ed., 2008).

²² Michael Wollersheim, *Considerations Towards the Legal Framework of Space Tourism*, presented at the 2nd International Symposium on Space Tourism, Bremen, Apr. 21–23, 1999, http://www.spacefuture.com/archive/considerations_towards_the_legal_framework_of_space_tourism.shtml.

²³ David Collins, *Efficient Allocation of Real Property Rights on the Planet Mars*, 14 B.U. J. SCI. & TECH. L. 201, 204 (2008).

quirements of space tourists.”²⁴ In this respect, we should not neglect the fact that air transportation and space travel, though in different geographical locations, are basically transportation. While the vehicles used for space tourism are rocket-powered and designed to enter outer space, they “take off and land like airplanes.”²⁵ Taking space vehicles into outer space will be like taking an airplane for travelers, although the destinations are different. Space travel, while still in its infancy, is similar to the air transportation industry in its early stage. Now, space travel faces the original question raised to the air transportation industry in the 1920s: how to alleviate liability so that the regime can effectively promote the rapid development and commercialization of the industry.²⁶ In this regard, we can certainly borrow from the successful legal experience of air transportation to facilitate the formulation of an appropriate regime for space travel.

A. COMMERCIAL LIABILITY REGIME

By referring to the liability issue in outer space, one may immediately think of the 1967 Outer Space Treaty²⁷ and the 1972 Liability Convention.²⁸ Article VII of the Outer Space Treaty provides that states are internationally liable for any damage caused by their objects or personnel while in space.²⁹ The Liability Convention, expanding on Article VII of the Outer Space Treaty, “provide[s] a legal framework for the full compensation of damage caused on Earth by the spacefarers as a result of their activities in outer space.”³⁰ It distinguishes two situations when the launching state(s) are liable: (1) “damage caused by its

²⁴ S.G. Sreejith, *Whither International Law, Thither Space Law: A Discipline in Transition*, 38 CAL. W. INT’L L.J. 331, 367 (2008).

²⁵ Recent Development: *Commercialization of Space Commercial Space Launch Amendments Act of 2004*, 17 HARV. J.L. & TECH. 616, 626 (2004) (quoting Rand Simberg, *Permission to Fly*, FOXNEWS.COM, Oct. 15, 2003, <http://www.foxnews.com/story/0,2933,100181,00.html>).

²⁶ McKay Cunningham, *The Montreal Convention: Can Passengers Finally Recover for Mental Injuries?*, 41 VAND. J. TRANSNAT’L L. 1043, 1046–1047 (2008).

²⁷ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 (entered into force Oct. 10, 1967) [hereinafter Outer Space Treaty].

²⁸ Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, T.I.A.S. No. 7762 [hereinafter Liability Convention].

²⁹ Outer Space Treaty, *supra* note 27, art. VII.

³⁰ JULIAN HERMIDA, LEGAL BASIS FOR A NATIONAL SPACE LEGISLATION 12 (2004).

space object on the surface of the earth or to aircraft in flight” and (2) “damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State.”³¹ Strict liability applies to the first situation³² while negligence liability applies to the latter.³³ From the plain language in the above provisions, states, not private entities, are the target for liability in case of damage.

In view of its international nature, the Liability Convention does not address the needs of two types of people, one being the nationals of the launching state.³⁴ Furthermore, only a state may present a claim for compensation.³⁵ Accordingly, the Convention fails to specifically outline civilian liability in outer space.³⁶ Before moving further, we may need to examine the ISS Intergovernmental Agreement (IGA).³⁷

³¹ Liability Convention, *supra* note 28, arts. II–III.

³² *Id.* art. II. The Liability Convention, Article II provides: “A launching state shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight.” *Id.*

³³ *Id.* art. III. The Liability Convention, Article III provides:

In the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible.

Id.

³⁴ *Id.* art. VII. The Liability Convention, Article VII provides:

The provisions of this Convention shall not apply to damage caused by a space object of a launching State to: (a) Nationals of that launching State; (b) Foreign nationals during such time as they are participating in the operation of that space object from the time of its launching or at any stage thereafter until its descent, or during such time as they are in the immediate vicinity of a planned launching or recovery area as the result of an invitation by that launching State.

Id.

³⁵ *Id.* art. VIII. The Liability Convention, Article VIII (1) provides: “A State which suffers damage, or whose natural or juridical persons suffer damage, may present to a launching State a claim for compensation for such damage.” *Id.*

³⁶ NANDASIRI JASENTULIYANA, INTERNATIONAL SPACE LAW AND THE UNITED NATIONS 390 (1999).

³⁷ Agreement Among the Government of Canada, Governments of the Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation, and the Government of the United States of America Concerning Cooperation on the Civil International Space Station, Jan. 29, 1998, available at <ftp://ftp.hq.nasa.gov/pub/pao/reports/1998/IGA.html> [hereinafter ISS IGA].

As one important multilateral treaty in outer space, the ISS IGA, while incorporating the Liability Convention, has further included a provision concerning the mutual exemption of liability on board the ISS for the purpose of better cooperation among the partners.³⁸ This mutual exemption provision applies to any claims brought by a Partner State for damage, against (1) "another Partner State; (2) a related entity of another Partner State; [and/or] (3) the employees of any of the above entities."³⁹ Obviously, space passengers cannot rely on this provision for any claims. The public nature of the IGA does not fit well in the present commercial regime.

The current liability system thereby excludes space tourism and only extends to efforts by states or international non-governmental organizations sending equipment and astronauts into space for the purpose of exploration and scientific research.⁴⁰ No provision whatsoever sheds light on liability relating to private entities. In this regard, private entities have neither any recourse nor accountability under the Outer Space Treaty and Liability Convention. Thus, the current liability regime does not adequately address the issue of liability to space tourists, which is believed to be one major concern in space tourism.

In the air transportation legal system, domestic and international transportation⁴¹ are differentiated. Similar differentiation does not exist in space travel. A uniform regime should be introduced applying directly to all space tourists and goods. Domestic tourists of a launching state, like that in international air

³⁸ Major Christopher M. Petras, "Space Force Alpha": *Military Use of the International Space Station and the Concept of "Peaceful Purposes"*, 53 A.F.L. REV. 135, 165 (2002).

³⁹ ISS IGA, *supra* note 37, art. 16(3)(a).

⁴⁰ Joseph A. Bosco, *International Law Regarding Outer Space—An Overview*, 55 J. AIR L. & COM. 609, 614–20 (1990); Ezra J. Reinstein, *Owning Outer Space*, 20 N.W. J. INT'L L. & BUS. 59, 71 (1999); Richard Berkley, Comment, *Space Law Versus Space Utilization: The Inhibition of Private Industry in Outer Space*, 15 WIS. INT'L L.J. 421, 422 (1997).

⁴¹ According to the Warsaw Convention, *supra* note 15:

international transportation shall mean any transportation in which, according to the contract made by the parties, the place of departure and the place of destination, whether or not there be a break in the transportation or a transshipment, are situated either within the territories of two High Contracting Parties, or within the territory of a single High Contracting Party, if there is an agreed stopping place within [the territory of another state] even though that [state] is not a [High Contracting Party].

transportation, should be allowed to claim compensation for damages suffered.

In international air transportation, the Warsaw Convention can be a good example for a uniform multilateral system for space tourism. The Warsaw regime has successfully enabled insurance companies to provide services in the field of international air transportation with confidence.⁴² We may optimistically expect the same result when a similar regime is set up. According to the Warsaw Convention, a negligence standard, instead of strict liability, was adopted and maximum damages awardable to a passenger were originally set at 125,000 francs.⁴³ The Warsaw Convention proved to provide the protection and freedom necessary for the air transportation industry to develop in the early stages of civil aviation. With this Convention, the industry was able to flourish and has now become the safest means of transportation.⁴⁴ However, the limitation of liability in the Convention is now considered unnecessary in view of the improving reliability of aviation. The revision work has been trying to balance the interests of the industry and other parties (including passengers and third parties), and the resulting 1999 Montreal Convention shows the sign of relaxing the above limitation.⁴⁵ The maximum amount of damages has been

⁴² Patrick Collins, *The Regulatory Agenda for the Era of Passenger Space Transportation*, Proceedings of 20th I.S.T.S., Paper No. 96-f-13 (1996), available at http://www.spacefuture.com/archive/the_regulatory_reform_agenda_for_the_era_of_passenger_space_transportation.shtml.

⁴³ James E. Dunstan, *Is Launching a Rocket Still an Ultra-Hazardous Activity? Toward a Negligence Theory for Launch Activities*, in *SPACE MANUFACTURING 9: THE HIGH FRONTIER: ACCESSION, DEVELOPMENT AND UTILIZATION* 226, 229 (Barbara Faughan ed., American Institute of Aeronautics and Astronautics 1993). See Warsaw Convention, *supra* note 15, art. 22(1). "In the transportation of passengers the liability of the carrier for each passenger shall be limited to the sum of 125,000 francs."

⁴⁴ Between 1959 and 2001, there were 1,307 accidents worldwide out of a total of approximately 412 million departures. BOEING COMMERCIAL AIRPLANE, STATISTICAL SUMMARY OF COMMERCIAL JET AIRPLANE ACCIDENTS: WORLDWIDE OPERATIONS 1959-2001 7-8 (2002), <http://www.fearofflying.com/pdf/Boeingaccidentstatusum59-01.pdf>. However, approximately 40,000 people die in automobile accidents and 1,000 in railway accidents each year. See U.S. Dept. of Transportation, A comparison of Risk, Accidental Deaths, United States, 1999-2003, Jan. 1, 2004, <http://www.phmsa.dot.gov/hazmat/risk/library> (follow "A Comparison of Risk" hyperlink).

⁴⁵ Convention for the Unification of Certain Rules for International Carriage by Air, art. 21, *opened for signature* May 28, 1999, ICAO Doc. 9740 [hereinafter Montreal Convention]. The carrier is always liable to a maximum amount of 100,000 SDR; for damages exceeding this amount, the carrier is liable without limitation unless "the carrier proves that: (a) such damage was not due to the

changed, taking into account social and economic development. However, the negligence standard remains the cornerstone of the Warsaw Convention.⁴⁶

The success of the international aviation system indicates that a negligence standard should be adopted in the early stage of space travel. Limiting the carrier's liability will not necessarily deter potential space tourists since they can buy additional insurance, as is the case in aviation. The maximum damages payable to passengers should be well defined. An appropriate amount should be determined based on several factors, including the ultimate goal of promoting the development of space travel, the financial situation of the space travel industry, and the general background of space passengers in the early stage of space travel. The duration of liability should similarly be the period during which the accident takes place on board the space object or in the course of any of the operations of embarking or disembarking.⁴⁷ In this regard, space objects should similarly be considered an extension of the jurisdiction of the launching state, whose law prevails;⁴⁸ disputes over liability in space travel could be effectively resolved in national courts according to the above general international law and/or national laws.

Legislation providing the above propositions is indispensable for space tourism. The uncertainty concerning the liability issue can make potential investors hesitant because any unknown future regulation may kill the business they are investing in. We may simply modify the Warsaw Convention for space tourism, but of course, we can formulate a new document written along

negligence or their wrongful act or omission of the carrier or its servants or agents; or (b) such damage was solely due to the negligence or other wrongful act or omission of a third party." From this provision, it is obvious that strict liability applies to the carrier.

⁴⁶ The Guatemala Protocol of 1971 provides that the fault liability at present attaching to the carrier will be changed into a risk liability. Protocol to Amend the Convention for the Unification of Certain Rules Relating to the International Carriage by Air, Signed at Warsaw on 12 October 1929, as Amended by the Protocol done at the Hauge on 28 September 1955, *opened for signature* Mar. 8, 1971, 10 I.L.M. 613, ICAO Doc. 8932 [hereinafter Guatemala City Protocol]. However few states have ratified this Protocol to date. ICAO Doc. No. 8932, <http://www.icao.int/icao/en/leb/Guatemala.pdf> (last visited Sept. 24, 2009).

⁴⁷ See Warsaw Convention, *supra* note 16, art. 17.

⁴⁸ Rochus Moenter, *The International Space Station: Legal Framework and Current Status*, 64 J. AIR L. & COM. 1033, 1053 (1999).

similar lines.⁴⁹ By referring to the proposed document, space tourists, governments, commercial operators and insurance companies would all know possible liabilities in advance and make sensible decisions accordingly. Thus, the international society would benefit from the transparency and legitimacy brought by such an international document.

B. SPACE INSURANCE

Space insurance has been available for a couple of years, especially in the field of satellite launching activities.⁵⁰ Further development of space activities has called for more active involvement of private parties. However, a complete set of rules are still to be formulated to realize private financing for space programs. Reasonable space investors clearly know that they are dealing with a cutting-edge technology where there are inherent dangers. In view of the high risks in space activities, the availability of insurance has been a critical element for private parties.

As one scholar rightly points out:

Passengers are likely (at least in the early, pioneering days) to be required to sign comprehensive waivers of liability in favour of the operator. However, most developed legal jurisdictions are unlikely to enforce these in the event of negligence by the operator. Appropriate passenger liability insurance will therefore be essential. The probable socio-economic profile of early space passengers (who are likely as a group to be more than averagely wealthy and to have high earning capacities) indicates the potential liability exposures will be high.⁵¹

In this regard, space insurance could provide effective relief for a whole range of liability risks currently associated with space activities, including space tourism.

Two main types of space insurance exist for space activities: insurance of space objects and liability insurance (including third-party liability and product liability).⁵² Insurance of space

⁴⁹ Anders Lindsfold, *Space Tourism and Its Effects on Space Commercialization*, Master of Space Studies Program 1999, http://www.spacefuture.com/pr/archive/space_tourism_and_its_effects_on_space_commercialization.shtml.

⁵⁰ Molly K. Macauley, *Flying in the Face of Uncertainty: Human Risk in Space Activities*, 6 CHI. J. INT'L L. 131, 141–42 (2005).

⁵¹ Richard Gimblett, *Space Insurance into the Next Millennium*, in OUTLOOK ON SPACE LAW OVER THE NEXT 30 YEARS: ESSAYS PUBLISHED FOR THE 30TH ANNIVERSARY OF THE OUTER SPACE TREATY 168 (Gabriel Lafferanderie & Daphne Crowther eds., 1997).

⁵² Ruwantissa Abeyratne, *Synergies and Problems in Outer Space Insurance and Air Transport Insurance*, 30 TRANSP. L.J. 189, 191–94 (2003).

objects can be further differentiated into: "(1) pre-launching insurance; (2) launch failure and initial operation insurance; and (3) insurance of the satellite itself."⁵³ The first satellite insurance contract (insurance of space objects) providing for pre-launching insurance services was concluded in 1965 for Intel-sat's "Early Bird."⁵⁴ Concerning liability insurance, the Commercial Space Launch Amendments Act of 2004 (CSLAA) of the United States⁵⁵ requires entities that launch space vehicles to purchase \$500 million in third-party liability insurance.⁵⁶ Space insurance per se is thus nothing new. The legal basis and principle of insurance remain largely applicable to space tourism. It is to be noted that "[i]nsurance policies for commercial launch activities [have] not [been] standardized and must be negotiated on a case-by-case basis."⁵⁷ To a certain extent, insurance companies' confidence concerning the scale of risks involved in launching depends much on agreed standards of acceptable risk.⁵⁸

The CSLAA also touches on the insurance issue in space tourism.⁵⁹ Its temporary indemnification and insurance scheme for the commercial human space flight industry requires space flight participants to purchase insurance and indemnifies those participants up to \$1.5 billion beyond the insurance cap.⁶⁰ Insurance for the carrier's liability in space tourism is thus not new to the insurance industry.

Understandably, considering the high risks involved in launching activities, insurance companies are concerned with potentially high damages. In this regard, it is important that the governments and the launch entities take measures to cover excess damages. As provided in the CSLAA, an insurance provider may list specific exclusions in the insured's liability insurance

⁵³ I.H. PH. DIEDERIKS-VERSCHOOR & V. KOPAL, *AN INTRODUCTION TO SPACE LAW* 114 (3rd ed., 2008).

⁵⁴ *Id.* at 114.

⁵⁵ Commercial Space Launch Amendments Act of 2004, 49 U.S.C. § 70112 (2006).

⁵⁶ 49 U.S.C. § 70112 (2006).

⁵⁷ Peter D. Nesgos, *The Challenges Facing the Private Practitioner: Liability and Insurance Issues in Commercial Space Transportation*, 4 J.L. & TECH. 21, 25-26 (1989).

⁵⁸ Extension of Space Launch Indemnification: Hearing Before the Subcomm. on Space and Aeronautics of the H. Comm. on Science, 106th Cong. 37-39 (1999) (statement of Patricia A. Mahoney, Chair, Satellite Industry Association).

⁵⁹ See generally 49 U.S.C. § 70112.

⁶⁰ *Id.*

policy.⁶¹ Consequently, the U.S. government acts as an excess insurance carrier, providing a layer on top of the required insurance.⁶²

In theory, for space tourism, the space liability insurance should work along the lines of the commercial liability regime. However, insurance companies need to make a profit, otherwise they will not enter the industry. Since space tourism is new, insurance companies will need to assess their own risks. Knowing how much they can potentially be liable for will be an excellent starting point. Again, the current aviation liability principles are excellent starting points for the insurance companies.

As one scholar has identified, "if tourism is to become a vital part of the commercial space equation, limits on liability for the owners and operators of space facilities and vehicles will be a necessity."⁶³ Limits could exist for liability arising out of death, personal injury, or loss or damage to property; limits could also be set for each and every space flight. In this regard, several factors are relevant to the fixed limits, such as the length of flight, the module and model of space objects, the experience of astronauts, and the air condition during the flight.

On the one hand, it is important to introduce insurance to the space tourism industry. At the present stage, this young industry requires support from various corners. The insurance industry is indispensable to space carriers, given the high market value of spacecraft and the great financial risks. On the other hand, it is critical to set an appropriate rate so that the insurance industry is willing to enter this potentially profitable market. Again, we can borrow successful experience from aviation. Previous experience tells us that the space insurance industry hinges closely on the evolution of space technology, and vice versa. We are fortunate to see that the insurance industry has been mature enough to accept the risks in the space industry since 1965.⁶⁴

Space tourism brings both challenges and opportunities to the space insurance industry. A temporary increase in insurance premiums is inevitable in the first stage. But in the long

⁶¹ 14 C.F.R. 440.13(a)(5) (2007).

⁶² This is argued to protect the U.S. Government. See Henry R. Hertzfeld & Frans G. von der Dunk, *Bringing Space Law into the Commercial World: Property Rights Without Sovereignty*, 6 CHI. J. INT'L L. 81, 93-94 (2005).

⁶³ Collins, *supra* note 42.

⁶⁴ See Abeyratne, *supra* note 52, at 191.

run, the insurance premiums will decline over time because of corresponding advancements in space technology and safety.

C. CRIMINAL JURISDICTION REGIME

At the current stage, the people on board space objects are normally astronauts trained for special missions. The commanders on board the space objects have the authority to enforce order and discipline during the whole flight phase.⁶⁵ The ISS IGA provides clear wording on the authority of a commander on board the ISS to maintain order.⁶⁶ Thus, the criminal jurisdiction issue does not appear highly relevant to outer space activities. Currently, no international treaty exists for crimes committed on private space vehicles.⁶⁷ This situation, while understandable with space activities still largely monopolized by states, is further justified by the fact that space objects are normally considered a natural extension of national territory.⁶⁸ With criminal jurisdiction being an issue of public nature, relevant national laws shall indisputably apply to those happening on board space objects.⁶⁹

Nevertheless, it is notable that the ISS agreement contains a provision on criminal jurisdiction.⁷⁰ This is necessary in view of the long-term character of the ISS and the international and multicultural character of the astronauts on board the ISS.⁷¹ Besides the execution of criminal jurisdiction over its nationals,⁷² Article 22 further provides the jurisdiction over nationals of an-

⁶⁵ Mary Catherine Devlin & William G. Schmidt, *Legal Issues Continue to Surround the International Space Station*, 8 U.S.A.F. ACAD. J. LEGAL STUD. 237, 243 (1997/1998).

⁶⁶ *Id.* at 244. "The [ISS IGA] considers the ISS to be a single craft with a single crew and command and control of the ISS on orbit will be planned by an integrated team with participation by all the partners, and with commands executed by the U.S. or by Russia." *Id.*

⁶⁷ R. Thomas Rankin, *Space Tourism: Fanny Packs, Ugly T-Shirts, and the Law in Outer Space*, 36 SUFFOLK U. L. REV. 695, 716 (2003).

⁶⁸ Andre Farand, *Legal Environment for Exploitation of the International Space Station*, in INTERNATIONAL SPACE STATION: THE NEXT MARKET PLACE 141, 141 (G. Haskell & M.T. Rycroff eds., 2000).

⁶⁹ *Id.*

⁷⁰ See ISS IGA, *supra* note 37, art. 22.

⁷¹ Stacy J. Ratner, *Establishing the Extraterrestrial: Criminal Jurisdiction and the International Space Station*, 22 B.C. INT'L & COMP. L. REV. 323, 323 (1999).

⁷² ISS IGA, *supra* note 37, art. 22(1). Article 22(1) of the ISS IGA provides: "Canada, the European Partner States, Japan, Russia, and the United States may exercise criminal jurisdiction over personnel in or on any flight element who are their respective nationals." *Id.*

other Partner State whose conduct in orbit "(a) affects the life or safety of a national of the affected Partner State or (b) occurs in or on or causes damage to the flight element of another Partner State."⁷³ It is thus obvious that the criminal jurisdiction is based on customary principles of nationality, supplemented by the protective principle.⁷⁴

However, space tourism brings new problems to the criminal jurisdiction issue. Space tourists are less prepared and controlled than astronauts, increasing the risk of criminal activities. Furthermore, the situation when a space tourist from a non-member country becomes the target of a criminal offence, which is often the case in space tourism, is not contemplated in the above ISS arrangement, which was designed for and among the Partner States.⁷⁵

In this aspect, we may first consider similar situations in air transportation. As early as 1963, the Convention on Offences and Certain Other Acts Committed on Board Aircraft (Tokyo Convention)⁷⁶ (and two other important international conventions: the 1970 Hague Convention⁷⁷ and the 1971 Montreal Convention⁷⁸) imposed a series of obligations upon the contracting states that are geared towards stamping out hijacking

⁷³ *Id.* art. 22(2). Article 22(2) provides:

In a case involving misconduct on orbit that: (a) affects the life or safety of a national of another Partner State or (b) occurs in or on or causes damage to the flight element of another Partner State, the Partner State whose national is the alleged perpetrator shall, at the request of any affected Partner State, consult with such State concerning their respective prosecutorial interests. An affected Partner State may, following such consultation, exercise criminal jurisdiction over the alleged perpetrator provided that, within 90 days of the date of such consultation or within such other period as may be mutually agreed, the Partner State whose national is the alleged perpetrator either: (1) concurs in such exercise of criminal jurisdiction, or (2) fails to provide assurances that it will submit the case to its competent authorities for the purpose of prosecution.

⁷⁴ *Id.*; see also Devlin, *supra* note 65, at 241.

⁷⁵ See ISS IGA, *supra* note 37, art. 22(1).

⁷⁶ The Convention on Offences and Certain Other Acts Committed on Board Aircraft, Sept. 14, 1963, TIAS No. 6768, 704 U.N.T.S. 219 [hereinafter Tokyo Convention].

⁷⁷ Convention for the Suppression of Unlawful Seizure of Aircraft, Dec. 16, 1970, 22 U.S.T. 1641, 860 U.N.T.S. 105.

⁷⁸ Convention for the Suppression of Unlawful Acts Against the Safety of Civil Aviation, Sept. 23, 1971, 24 U.S.T. 565, 974 U.N.T.S. 178.

and other relevant offences against aviation safety.⁷⁹ According to the Tokyo Convention, apart from national criminal jurisdiction, "each contracting State shall take measures as may be necessary to establish its jurisdiction as the State of registration over the offences committed on board an aircraft registered in that state."⁸⁰ The above provision is claimed to establish the "universal jurisdiction" principle.⁸¹ All states have criminal jurisdiction over any acts causing danger to the aviation industry,⁸² which has an important impact on the safe operation of the industry and the confidence from the passengers.

Space tourism also needs to build confidence from potential passengers, preventing the infant industry from fatal criminal activities. The "universal jurisdiction" principle in air transportation is thus meaningful to the development of space tourism. Interested parties should convene to discuss a similar treaty cracking down on criminal acts against space safety.

III. REGISTRATION AND LICENSING REGIME

A. REGISTRATION REGIME

As mentioned above, large scale space tourism depends on the development of RLVs.⁸³ No doubt, RLVs are space objects as identified in the Registration Convention.⁸⁴ According to this Convention, each party is required to register and maintain a registry of its launched space objects.⁸⁵ In addition, the party must provide the UN Secretary-General information proving the

⁷⁹ Tokyo Convention, *supra* note 76, art. 1(1). Article 1(1) of the Tokyo Convention provides that the Convention applies to "(a) offences against penal law; (b) acts which, whether or not they are offences, may or do jeopardize the safety of the aircraft or of persons or property therein or which jeopardize good order and discipline on board." *Id.*

⁸⁰ *Id.* art. 4(3).

⁸¹ Lieutenant Colonel Andrew S. Williams, *The Interception of Civil Aircraft over the High Seas in the Global War on Terror*, 59 AIR FORCE L. REV. 75, 124 (2007).

⁸² R.I.R. Abeyratne, *Attempts at Ensuring Peace and Security in International Aviation*, 24 TRANSP. L.J. 27, 30-31 (1996).

⁸³ Moore, *supra* note 10, at 251.

⁸⁴ Registration of Objects Launched into Outer Space, Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter Registration Convention]. Article 1(b) of the Registration Convention provides that "the term 'Space object' includes component parts of a space object as well as its launch vehicle and parts thereof." *Id.* at art. 1(ii)(b). Michael C. Mineiro, *Law and Regulation Governing U.S. Commercial Spaceports: Licensing, Liability, and Legal Challenges*, 73 J. AIR L. & COM. 759, 770 (2008).

⁸⁵ Registration Convention, *supra* note 84, art. 2.

establishment of a registry.⁸⁶ The UN Secretary-General then has the duty to maintain a registry and open the contents of the registry for public inspection.⁸⁷ The Registration Convention relies on the view that preserving outer space for peaceful purposes depends largely on a complete registry of spacecraft.⁸⁸ The required information as defined in the Convention is reasonable for such purposes as identification of space objects and determining liability. However, when space tourism develops and the launching of RLVs becomes more and more frequent, the requirement of international registration for each and every launch appears infeasible and unnecessary.

In this regard, the aviation industry again provides a good example: national registry is sufficient for space tourism. In order to balance international security and public safety with non-bureaucratic procedures, it would be reasonable to allow the co-existence of two registration regimes. The current registration regime continues to exist; however, once space objects like RLVs are used specifically for commercial space travel, only national registry would be required.⁸⁹ To make sure that the existing national registration requirements are not too cumbersome for private parties to provide frequent space travel, we will also need to re-examine the information required for national registration. This task shall be taken by the states themselves.

B. LICENSING REGIME

A national licensing regime, providing sufficient supervisory service over space tourism, is vital to ensure the safety of space tourism and the peaceful purpose of such activities. In other words, an appropriate licensing regime, as the safety valve for security in space travel, is the obligation of the relevant state in guaranteeing the legitimate operation of those licensees.

The United States has established a rather complete legal framework in the licensing regime. As early as 1998, the Commercial Space Act⁹⁰ laid down the regulatory groundwork for

⁸⁶ *Id.* art. 2, 4.

⁸⁷ Julie C. Easter, *Spring Break 2023—Sea of Tranquility: The Effect of Space Tourism on Outer Space Law and World Policy in the New Millennium*, 26 SUFFOLK TRANS-NAT'L L. REV. 349, 363–64 (2002–2003).

⁸⁸ Michael J. Listner, *The Ownership and Exploitation of Outer Space: A Look at Foundation Law and Future Legal Challenges to Current Claims*, 1 REGENT J. INT'L L. 75, 84 (2003).

⁸⁹ Mineiro, *supra* note 84, at 771.

⁹⁰ Commercial Space Act of 1998, 14 C.F.R. § 431.31 (2009).

RLV licensing. According to the Act, prospective applicants are required to participate in pre-application consultations with the Office of the Associate Administrator for Commercial Space Transportation (FAA-AST);⁹¹ following pre-application consultations, applicants must obtain policy approval, safety approval, payload and payload reentry approval, and environmental approval.⁹² The provision governing the application procedure consists of the time requirements allotted to the government to review and grant or reject the application.⁹³ The above requirements have been argued to be too complicated, which will ultimately prevent private companies from getting off the ground.⁹⁴

It has been acknowledged that a more streamlined system of requirements is needed to facilitate the licensing process.⁹⁵ Once technologies are mature, RLVs are expected to send tourists to space on a regular basis; RLVs will be used like commercial airlines. The complicated process will surely discourage space travels. In light of the private parties' wanting to relax the current licensing regime and the government's concerns over safety and national security, the question is how to create a licensing regime to promote expeditious review so that launchings can be frequent and, from an investor's point of view, profitable, yet safe for the public and national security.

A state, no doubt deservedly, has broad powers to protect the public and national security. The point here is not to argue against the substantive standards of the licensing review, as they are necessary, but to encourage the government to carry out the review more efficiently, which specifically refers to a shorter period of time for the review.

⁹¹ 14 C.F.R. § 431.5 (2001).

⁹² See 14 C.F.R. § 415 (2001).

⁹³ Commercial Space Act of 1998, *supra* note 90, sec. 102. Commercial Space Launch Amendments, § 70104 Restrictions on launches, operations, and reentries provides:

The Secretary shall transmit to the Committee on Science of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a written notice not later than 30 days after any occurrence when a license is not issued within the deadline . . . [the Secretary may establish] criteria for accepting or rejecting an application for a license under this chapter within 60 days after receipt of such application.

⁹⁴ Charity Trelease Ryabinkin, *Let there be Flight: It's Time to Reform the Regulation of Commercial Space Travel*, 69 J. AIR L. & COM. 101, 129 (2004).

⁹⁵ *Id.* at 137.

The CSLAA,⁹⁶ with the aim of regulatory reform and improved interaction with RLV developers, replaces the original legislation from 1984⁹⁷ and has consequently ensured its purpose to promote the development of the emerging commercial human space flight industry.⁹⁸ An entirely new, experimental permit is created granting an unlimited number of launches and reentries for the covered design and eliminating the previous burden and cost of securing a new license for each test.⁹⁹ Considering the high risks entailed and unwavering emphasis on safety, the complex licensing process is retained. However, the licensing procedures have been further streamlined. Only one license or permit is required from the Department of Transportation to conduct activities involving crew or space flight participants, including launch and reentry, for which a license or permit is required.¹⁰⁰ The time period needed for relevant bodies to take action has been clearly defined, thereby preventing undue interference from relevant bodies.¹⁰¹ The CSLAA represents the trend of deregulation in the field to avoid "the potential danger of industry-killing over-regulation."¹⁰²

The United States example clearly shows the vital role of a licensing regime in commercial space activities and represents the first significant step towards nurturing and supporting commercial efforts in space tourism. In view of the complicated but indispensable licensing process, the FAA-AST has taken realistic measures to work directly with RLV developers, helping them to better understand the process and reflecting their concerns in

⁹⁶ Commercial Space Launch Amendments Act of 2004, H.R. 3752, 108th Cong. (2004).

⁹⁷ It is argued that the pre-2004 version of the 1984 Commercial Space Launch Act did not address space tourism directly. See Glenn Harlan Reynolds, *International Space Law in Transformation: Some Observations*, 6 CHI. J. INT'L L. 69, 70 (2005).

⁹⁸ The Commercial Space Launch Act of 2004, H.R. 5382, 108th Cong. (2004).

⁹⁹ Commercial Space Launch Amendments Act of 2004, 49 U.S.C. § 70105a(e)(1) (2006).

¹⁰⁰ *Id.* § 70104(d).

¹⁰¹ For example, 49 U.S.C. § 70105a(a) provides that the Secretary of Transportation shall issue the experimental permit required by human space vehicle operators no later than 120 days after receipt of an application and that the Secretary of Transportation would be obliged to inform the applicant of any issues arising during the review of an application and actions to be taken to resolve them, within the first 90 days after the receipt of the application. *Id.* § 70104(d).

¹⁰² Rand Simberg, *Permission to Fly*, FOXNEWS.COM, Oct. 15, 2008, <http://www.foxnews.com/story/0,2933,92840,00.html>.

future space flight policy.¹⁰³ This will help streamline the licensing requirements. With the United States example in place, the rest of the world must continue their work to make their licensing procedures more efficient and to formalize their commitment with shorter processing time allotted in their laws.

IV. THE STATUS OF SPACE TOURISTS

The emergence of space tourists who go to outer space for leisure poses challenges to the existing space legal regime. The 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space (Rescue Agreement)¹⁰⁴ outlines rules on rescuing astronauts when they have suffered an accident, experienced conditions of distress, or have made an emergency or unintended landing.¹⁰⁵ According to the Rescue Agreement, nations are obliged to perform rescue duties for the personnel of a spacecraft under their jurisdiction or on the high seas or in any other place not under the jurisdiction of any nation.¹⁰⁶ It is to be noted that "personnel of a spacecraft," instead of the term "astronauts," is used in the title of the Rescue Agreement and in the text of the Agreement.¹⁰⁷ Obviously, the term "astronauts" is not necessarily equivalent to the term "the personnel of a spacecraft." The term "personnel of a spacecraft" is a broader concept, including astronauts, space engineers, and scientists.¹⁰⁸ By using a broader concept in the text, the Rescue Agreement applies to broader categories of people on board spacecraft.

Obviously, space tourists are not astronauts or personnel of a spacecraft in the literal sense. If they are trained as mission specialists, like space engineers or scientists, there will not be much

¹⁰³ See, e.g., Catherine E. Parsons, *Space Tourism: Regulating Passage to the Happiest Place Off Earth*, 9 CHAP. L. REV. 493, 512–15 (2006).

¹⁰⁴ Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched Into Outer Space, Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119 [hereinafter Rescue Agreement].

¹⁰⁵ *Id.* arts. 1–4.

¹⁰⁶ *Id.* art. 1. David Tan, *Towards a New Regime for the Protection of Outer Space as the "Province of All Mankind"*, 25 YALE J. INT'L L. 145, 158 (2000); Ty S. Twibell, *Space Law: Legal Constraints on Commercialization and Development of Outer Space*, 65 U.M.K.C.L. REV. 589, 595 (1997).

¹⁰⁷ See Rescue Agreement, *supra* note 104.

¹⁰⁸ Fred Kosmo, *The Commercialization of Space: A Regulatory Scheme that Promotes Commercial Ventures and International Responsibility*, 61 S. CAL. L. REV. 1055, 1070–71 (1988).

dispute concerning the application of the Rescue Agreement.¹⁰⁹ For example, the world's second space tourist, Mark Shuttleworth, spent eight days on board the ISS as both a tourist and as an assistant to the crew, helping with a variety of tasks including the transfer of supplies and scientific experiments.¹¹⁰

However, this is an exceptional case. Space tourists generally do not play a direct role for the benefit and in the interests of all countries. Their main objective is not to contribute to the public interest, but to their personal pleasure. In no sense do they qualify as "envoys of mankind in outer space."¹¹¹ It is doubtful that space tourists can be considered as personnel of a spacecraft.¹¹² Accordingly, ambiguities exist in applying the Rescue Agreement to space tourists.

Nevertheless, just as identified in the preface, the Rescue Agreement is prompted by "sentiments of humanity."¹¹³ Such consideration similarly applies to the rescue of space tourists. Thus, two ways can be sorted out to deal with the issue of rescuing tourists in the event of an accident, of distress, or an emergency landing—either formulating a new agreement with similar provisions of the Rescue Agreement or extending the existing agreement to the application of space tourists. In view of similar measures underlying the rescue of astronauts and tourists, extending the application of the Rescue Agreement appears to be a sensible choice. Indeed, some scholars have argued that a broad interpretation to include space tourists in the category of "personnel of a spacecraft" seems more appropriate.¹¹⁴

In this respect, the CSLAA and the ISS IGA offer useful experience. The two documents take different approaches. The CSLAA clearly defines two different types of people involved in space flight. It provides definitions for the terms "crew" and

¹⁰⁹ Yasuaki Hashimoto, *The Space Plane and International Space Law*, SPACE FUTURE, http://www.spacefuture.com/archive/the_space_plane_and_international_space_law.shtml (last visited Sept. 23, 2009).

¹¹⁰ Steven Freeland, *Up, Up and . . . Back: The Emergence of Space Tourism and Its Impact on the International Law of Outer Space*, 6 CHI. J. INT'L L. 1, 3 (2005); Space.com, Space Tourist's Science Advisor Describes Shuttleworth's Experiments, Apr. 15, 2002, http://www.space.com/missionlaunches/shuttleworth_update_020415.html (last visited Sept. 23, 2009).

¹¹¹ Outer Space Treaty, *supra* note 27, art. 5.

¹¹² Freeland, *supra* note 110, at 10.

¹¹³ Rescue Agreement, *supra* note 104, Preface.

¹¹⁴ Stephan Hobe, *Military, Commercial, and Tourism Dimensions: Legal Aspects of Space Tourism*, 86 NEB. L. REV. 439, 455 (2007); V.S. Vereshchetin, *Legal Status of International Space Crews*, 3 ANNALS OF AIR & SPACE L. 545, 550–51 (1978).

"space flight participants" and amends previous commercial launch legislation to include these terms alongside the inanimate payloads currently covered.¹¹⁵ According to this act:

'[C]rew' means any employee of a licensee or transferee, or of a contractor or subcontractor of a licensee or transferee, who performs activities in the course of that employment directly relating to the launch, reentry, or other operation of or in a launch vehicle or reentry vehicle that carries human beings.¹¹⁶

"'Space flight participant' means an individual, who is not crew, carried within a launch vehicle or reentry vehicle."¹¹⁷ So, according to the above definitions, space tourists are naturally considered as space flight participants. This is a direct way to differentiate "crew" from "space tourists." However, this approach does not effectively resolve the issue of protection for space tourists as defined in the Rescue Convention.

The ISS IGA, as does the Rescue Convention, defines the term "crew" as qualified personnel in the first place.¹¹⁸ But, this agreement further provides the activities of all individuals involved in outer space *activities* under the heading "Protected Space Operations."¹¹⁹ This extensive provision validly resolves the above dilemma: the ISS IGA covers all individuals, no matter if she is piloting a spacecraft, conducting experiments, or is merely a passenger for fun. This approach is most instructive to the extended application of the Rescue Agreement to space tourists.¹²⁰

While receiving necessary humanitarian protections, space tourists, as passengers of a spacecraft, should also comply with rules for good order during the journey. Basically, their rights and obligations fall within the competence of the state exercising jurisdiction and control, namely, the state of registry of the RLV.¹²¹ The commander, providing for the safety and well-being of all persons on board, shall have sole authority throughout the flight. Space tourists, irrespective of their nationality, are subject to the directions of the commander.¹²²

¹¹⁵ Recent Development, *supra* note 25, at 627.

¹¹⁶ H.R. 3752, 108th Congress (2004), art. 3(b)(2).

¹¹⁷ *Id.* art. 3(b)(9).

¹¹⁸ ISS IGA, *supra* note 37, art. 11(1).

¹¹⁹ *Id.* art. 16(2)(f).

¹²⁰ Hobe, *supra* note 114, at 455–56.

¹²¹ *Id.* at 455.

¹²² *Id.* at 454.

V. CONCLUSION

The story on the space hotel as described in the beginning of this article is no longer imagination. Many organizations and states estimate that space flights will be followed by week-long vacations to space hotels by 2017.¹²³ By 2030, as many as 10 million people could travel to space with 80,000 guests staying at space hotels and other facilities during the course of a year.¹²⁴

Space tourism has so far received great interest from various sides. Some scholars believe that space "tourism may be one of the first space industries to emerge and that it will then pave the way for everything else."¹²⁵ Encouraged by the success of the first two space tourists, space tourism companies, having been set up in recent years, are actively promoting the program and soliciting support from governments.¹²⁶ As reported, Hong Kong Space Travel Agency signed a cooperative agreement in early 2005 with United States tour operator Space Adventures.¹²⁷ More than 20 Chinese tourists will be sent to the United States for training and the first Chinese tourist is scheduled to travel to space in the near future.¹²⁸ The reports released so far have sent a clear sign to the public that space tourism has reached a new era.

Drastically different from other means of transportation, such as shipping and aviation, which are governed by a comprehensive framework of national and international commercial law, space activities are supported by inter-governmental treaties negotiated during the peak of the cold-war period. The current legal principles related to outer space do not address the needs of the new "spacefarers" on the horizon.

While commercial space tourism is becoming a reality, the legal regime is still lagging far behind. The inadequacy and uncertainty in the current legal regime will discourage investment in space travel technologies and space tourism. In view of the

¹²³ Sara Marani, *Holidays in Space Only 20 Years Away?*, SPACE.COM, Nov. 18, 1999, http://www.space.com/missionlaunches/launches/space_holiday_991119_wg.html.

¹²⁴ Patrick Collins, *The Space Tourism Industry in 2030*, February 2000, available at http://www.spacefuture.com/pr/archive/the_space_tourism_industry_in_2003.shtml (last visited Sept. 23, 2009).

¹²⁵ ALBERT A. HARRISON, *SPACEFARING: THE HUMAN DIMENSION* 12 (2001).

¹²⁶ Marani, *supra* note 123.

¹²⁷ *Wealthy Chinese May Soon Embark on Private Space Flights*, SPACEDAILY.COM, Feb. 28, 2005, <http://www.spacedaily.com/news/china-05w.html> (last visited Sept. 23, 2009).

¹²⁸ *Id.*

many commonalities shared by aviation and space travel, this article takes the example of aviation and elaborates on the formulation of a legal regime for space tourism. Actually, it is gradually being accepted that the most appropriate regulatory framework for space tourism is to treat it as an extension of aviation.¹²⁹ A proper and attractive legal regime (including the so-called “space hotel rules”) will, in the end, help assure the future of safe and responsible commercial space tourism. Reassurance that an efficient, stable legal regime is in place allowing for more frequent launching services will directly lead to greater revenue, a return on investment, and a benefit to society, thereby encouraging investment in space technologies and space tourism in the long run.

¹²⁹ Patrick Collins & Koichi Yonemoto, *Legal and Regulatory Issues for Passenger Space Travel*, http://www.spacefuture.com/pr/archive/legal_and_regulatory_issues_for_passenger_space_travel.shtml (last visited Sept. 23, 2009).